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AND
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THOMAS-MORSE AIRCRAFT CORPORATION

Thomas-Morse Training 2-Seater in flight over Ithaca, N. Y.

THOMAS-MORSE AIRCRAFT CORPORATION

MARK

THE rise of the Glenn L. Martin Company from its inception in a tiny garage in California, to its present position forms a brilliant chapter of accomplishment in the History of Aeronautics—a History but just begun.

Glenn L. Martin, young in years, is a Pioneer in flying. He taught himself to fly. He built his own machines. At nineteen he opened the little California garage. Here he dreamed his dream of the big future. Here he worked by day and studied by night to make his vision a reality.

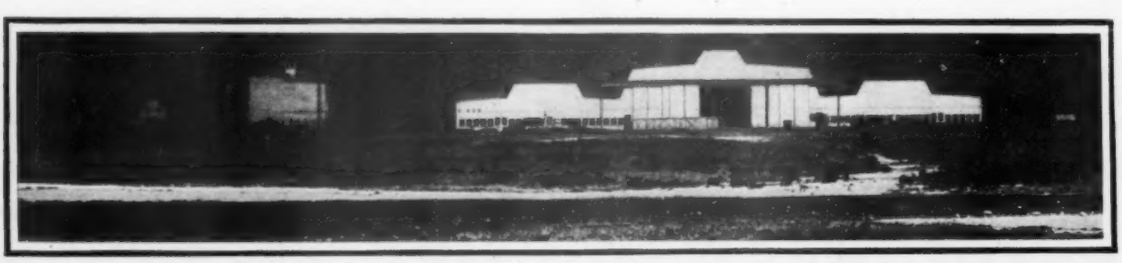
At twenty-three Mr. Martin was an expert flier and a successful builder. Eight years ago he received official recognition from the United States as a builder of dependable aircraft. And from the humble roof tree in California has sprung the big plant in Cleveland.

On Armistice Day the mightiest bomber in existence was the now famous Martin Bomber. The Martin Commercial Plane will accept no lower place in Peace.

THE GLENN L. MARTIN COMPANY

CLEVELAND

Member of the Manufacturers Aircraft Association



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Air Supremacy

MAJOR GENERAL SEELY, Under Secretary of State for Air has recently made the claim that "England's claim to air supremacy cannot be gainsaid by any other power," He is further quoted as having stated: "Our peculiar position demanded it, and it was essential to our far-flung Empire to have both air and sea supremacy. Marshal Foch said that the next war would be in the air, because it will be swift, secret and most deadly."

Just what "supremacy in the air" means in the present confused state of aeronautical opinion is difficult to determine. If it means airplanes in service the conclusion is incorrect as practically all airplanes now in the service of all countries would be obsolete the day war was declared. Every country has advanced types that are now in the experimental stages which will render present aircraft valueless against them.

If General Seely means the forces now available in the permanent Air Service organization, the basis will be deceptive for the reserve power of each country in the form of ex-service fliers will for several years at least be a real factor in determining a country's air strength.

It would be interesting if the Chief of Air Service would give to the public a comparative estimate of the present air strength of all countries in the same way as navies are compared. It might surprise some of our foreign friends to learn the situation.

The Legacy from War Aviation

THERE has recently been displayed a tendency to deprecate the advantages to civil aviation accuring from war aviation. It is claimed that military necessity forced lines of development that are of very little use to civil aeronauties and that designers find it difficult to get away from the criteria of design that they had been accustomed to for four or five years. The claim is made that those lines of development that help civil aeronauties would have been followed to as great or greater extent had there been no war.

One of the principal advantages that has resulted from the war has been the education of the public in many ways. About 22,000 aviators were trained by this government. Their families, and to a lesser extent their friends, became vitally interested in aviation. The countrysides within about 150 miles of the many flying fields in the country became accustomed to see airplanes in the sky regularly. The deeds of our aces were recounted with the greatest care in the daily press and national magazines. All of these influences were a direct result of the war.

It is difficult to conceive of a normal development of civil aviation that would have gained so much interest. The value of educating the public lies in the fact that the commodity that civil aviation must sell is transportation and that the public is the buyer. If the public does not accept aviation as an accomplished fact it certainly will not buy air transportation.

The war called into being many laboratories and trained staffs. Much of the work of these staffs was along purely aerodynamic lines which is applicable to any type of aircraft. These laboratories still exist, though with curtailed activities due to present lack of funds. Does any one pretend that as much valuable data would have been collected under the normal advancement of civil aviation, starting from its condition in 1914?

The Air Mail

THE action of the Senate Post Office Committee in restoring the Air Mail appropriation in the Post Office appropriation bill is one of the most fortunate decisions that could have been made for aeronautical progress in this country. Just at this time when the political situation is complicated by the impending executive changes, it would be a disastrous blow to aviation if the new Postmaster General were to be hampered in his consideration of the future of the Air Mail by a shortage of operating funds. If Congress will give the Air Mail reasonable funds to expend under the new Administration, then progress can continue.

In this connection it is to be earnestly hoped that the next Postmaster General will be far sighted and regard the Air Mail achievements of the last three years worthy of the heartiest support. One of the most important appointments to be made by the next Adminstration and one that will have a direct effect on the development of aeronauties in this country is the position of Second Assistant Postmaster General. Otto Praeger has carved a niche in the American Aeronautical Hall of Fame which will always be respected and admired. If his successor is as broad minded and discerning as the present head of the Air Mail, it will be a fortunate appointment.

Flying to Canada

THE Canadian Air Regulations of 1920 provide that airplanes entering Canada must be registered in the United States; that their pilots must be duly qualified military pilots and that they must not carry passengers for hire between points both of which are in Canada.

Since all Air Service officers must obtain authority to fly outside the limits of the United States before embarking upon a flight, it is believed that the infringement of the laws referred to comes from civilian fliers, who, no doubt, may not be aware of the Canadian air regulations.

Under present legislation there is no governmental agency in the United States charged with the control of aerial traffic nor is there any machinery in existence for promulgating information to aviators out of service except through aeronautical publications and the newspapers.

It is fortunate that the Canadian authorities have been so tolerant of the lax flying control in the United States. There is no doubt that if this condition continues much longer many delicate questions will arise which may prove embarrassing to both countries.

Myron T. Herrick, President of Aero Club

The announcement that Myron T. Herrick of Cleveland had been elected president of the Aero Club of America has aroused the greatest interest in all who are identified with aeronautics. Since the American Flying Club and the Aero Club amalgamated, many new policies have been considered. Most of them have had as their basis the nationalization of the work and membership of the club. It is now proposed to extend the membership of the club so that it may eventually be-

MYRON T. HERRICK
PRESIDENT OF THE AERO CLUB OF AMERICA
(*Underwood & Underwood*)

come a country-wide organization of many thousand members.

Mr. Herrick brings to the club a wide and varied experience. He was born at Huntington, Ohio, October 9, 1855 and was a student at Oberlin College and Ohio Wesleyan University. He was admitted to the bar in 1878 and practiced law in Cleveland until be became interested in banking. He has been president of the Society for Savings of Cleveland for many years. He has also served as president of the American Bankers Association.

His political career has been noteworthy. After holding several city and state offices he was elected governor of Ohio. He was a strong personal friend of President McKinley and served on his staff when he was governor. Later in 1912 he was appointed ambassador to France and served as such during the first trying months of the World War. In recognition of the great service rendered by Mr. Herrick, the Republic of France has conferred upon him the Grand Cross of the Legion of Honor. He is a trustee of the Carnegie Institute of Washington and is chairman of the American Committee for Devastated France.

Mr. Herrick has been interested in aviation since the early days of its development. He is one of our best known Americans, having to his credit a long life devoted in large part to the public service.

Mr. Herrick brings to the presidency of the Aero Club of America the benefit of a broad experience in both national and international affairs, and under his direction, will be carried forward an aggressive campaign for the strengthening of the Aero Club's national organization devoted to the furtherance of aeronautical development both for civil and national defense purposes.

Colonel Jefferson DeMont Thompson, who has acted as president of the Aero Club of America during the re-organization period, becomes chairman of the Board.

The Aero Club of America Board of Governors under the new leadership will present in a short time the board plans which have been considered and it is believed that its influence as a national organization will be greater than any local club can be. As representative of the F. A. I. it can accomplish much by the broader plan. Its influence on aeronautic legislation will be more far reaching than it has been and its membership will feel that it is accomplishing more results.

Aero Club of America Notes

Accommodations Increased

Dormitory facilities at the Club have been increased by turning the second floor of the Club House at 9 East 38th St., which was used as an aeronautic library, into a dormitory. The library has been moved to the first floor, and a very attractive grill-room has been opened which has become popular with the members of the Club.

Aviators' Ball

Plans are being made to hold an aviators' ball in the near future, which promises to be a great success and will give an opportunity to many of the officers to meet their friends attending the ball.

Aviation Country Club of Detroit Affiliates with Aero Club

Colonel H. W. Alden, president of the Aviation Country Club of Detroit presented a formal application for affiliation with the Aero Club of America to the Board of Governors of the Aero Club at a recent meeting, when it was accepted into affiliation.

Pulitzer Trophy Race to be Held at Detroit, Labor Day

The Contest Committee of The Aviation Country Club of Detroit, of which J. G. Vincent, is chairman, will conduct the contests for the Pulitzer Trophy on Labor Day, 1921, at Detroit.

New Director of Naval Aviation

Capt. William A. Moffett, U. S. N., has been assigned to duty as Director of Naval Aviation in the Office of Naval Operations, relieving Capt. Thomas T. Craven, U. S. N., who is due for sea duty. Pending the adjustment of important matters in connection with Naval Aviation, however, Captain Craven will remain on duty at the Navy Department for some time.

In the World War Captain Moffett was in command of the Great Lakes Naval Training Station, and is now in command of the U.S.S. *Mississippi* of the Pacific Fleet. He has taken a keen interest in aviation and has given much attention to the activities of the air detachment of the fleet. Captain Craven in his post as director during the last two years has shown an ability and capacity for advancing the interests of naval aviation which has been highly appreciated in the Navy Department. In his tenure the NC-4 made the transatlantic flight, in the preparation for which the most important administrative duties devolved upon Captain Craven.

With a Bureau of Aeronautics and a Flying Corps organized in the Navy, the opportunities for the chief of that bureau will be immensely enhanced, but under existing conditions relative to aviation Captain Craven has made a steady advance, and he will leave to his successor a firm foundation for the upbuilding of a large naval air program.

Naval Aviation Estimates for 1922

A. Subhead No. 1. Necessary Aircraft

Number asked	Items	Bureau of C. & R.	Bureau of Engineering.	Total
2	NC Boats	$300,000·00	$52,000.00	$352,000.00
7	Ships' Spotting Planes	105,000.00	185,700.00	290,700.00
17	Ship's Fighting Planes	297,500·00	401,000·00	698,500.00
33	Torpedo Planes	1,485,000.00	1,549,000.00	3,034,000.00
8	Photographic Planes	120,000.00	35,100·00	155,100·00
	Marines.			
25	Reconnaissance, Photographic and Bombing Planes	437,500.00	500,000.00	937,500.00
14	Pursuit Airplanes	245,000.00	274,800.00	519,800·00
22	Practice Planes	330,000.00	396,000.00	726,000.00
128	TOTAL HEAVIER-THAN-AIRCRAFT	$3,320,000·00	$3,393,600.00	$6,713,600.00
14	Free Balloons			
	(8—19,000 cu. ft.)	$32,000·00	. . . . .	$ 32,000.00
	(6—35,000 cu. ft.)	33,000.00	. . . . .	33,000.00
34	Kite Balloons	510,000.00	. . . . .	510,000.00
2	Small Towing Airships	120,000.00	$ 14,000.00	134,000·00
	2 Spare Envelopes	50,000.00	. . . . .	50,000.00
4	Non-Rigid Airships, Approximate B-Size	300,000.00	35,000.00	335,000.00
	3 Spare Envelopes	90,000·00	. . . . .	90,000·00
4	Non-Rigid (Twin Engine) Approximate C-Size	360,000.00	49,000.00	409,000.00
	2 Spare Envelopes	70,000.00	. . . . .	70,000·00
2	Rigid Airships, to be begun	2,000,000.00	684,800.00	2,684,800.00
60	TOTAL LIGHTER-THAN-AIRCRAFT	$3,565,000.00	$782,800.00	$4,347,800.00
	To continue authorized construction of Giant Boat	$200,000.00	$90,000.00	$290,000.00
	To continue miscellaneous new work (in Government Plants), uncompleted July 1, 1921	200,000.00	100,000.00	300,000.00
	TOTAL COMBINED L/A AND H/A CRAFT	$400,000.00	$190,000.00	$590,000.00
	GRAND TOTAL SUBHEAD NO. 1			$11,651,400.00

B. Subhead No. 2. Necessary Equipment for L/A and H/A Craft

Items	Bureau of C. & R.	Bureau of Engineering.	Total
Miscellaneous Equipment for New Aircraft	$60,000.00	. . . . .	$60,000.00
Radio Accessories and Equipment and to replace obsolete equipment		$578,720.00	578,720.00
Engine Spare Parts, Liberty, Hispano-Suiza, Union, etc. now in service		850,000.00	850,000.00
Power Plant Equipment for above		100,000.00	100,000.00
TOTAL NECESSARY EQUIPMENT	$60,000.00	$1,528,720.00	$1,588,720.00
GRAND TOTAL SUBHEAD NO. 2			$1,588,720.00

E. Subhead No. 5. Navigation New Equipment

Items	Bureau of Navigation	Total
Navigation Equipment	$28,250.00	
Photographic Equipment	46,000.00	
Aerological Equipment	20,000.00	
Equipment and installation of instrument Repair Shops	25,000.00	
TOTAL		$119,250.00
GRAND TOTAL SUBHEAD NO. 5		$119,250.00

F. Subhead No. 6. Maintenance and Operation of Aircraft Factory Helium Plant, etc.

Stations and Activities	Bureau of C. & R.	Bureau of Eng.	Bureau of Y. & D.	Bureau of S. & A.	Bureau of Nav.	Total
Pacific Fleet — Langley					$ 3,000.00	$ 3,000.00
Pacific Fleet — Shawmut					3,000.00	3,000.00
Pacific Fleet — NC Tender					1,000.00	1,000.00
Pacific Fleet — Battleships						
Pacific Fleet — Landing Field	$118,000.00	$439,855.00	$ 50,000.00	$ 9,000.00	$ 600.00	$617,455.00
Atlantic Fleet — Wright					3,000.00	3,000.00
Atlantic Fleet — Aroostook					3,000.00	3,000.00
Atlantic Fleet — NC Tender					1,000.00	1,000.00
Atlantic Fleet — Battleships						
Atlantic Fleet — Landing Field	118,000.00	439,855.00	50,00.00	6,000.00	600.00	614,455.00
Hampton Roads	70,000.00	219,162.00	200,000.00	30,000.00	5,000.00	524,162.00
Pensacola	210,000.00	679,770.00	300,000.00	30,000.00	6,000.00	1,225,770.00
Rockaway	40,000.00	126,610.00	150,000.00	2,400.00	4,000.00	323,010.00
Anacostia	15,000.00	54,413.00	30,000.00	1,200.00	4,000.00	104,613.00
Coco Solo	20,000.00	146,410.00	50,000.00	2,000.00	4,000.00	222,410.00
San Diego	70,000.00	427,600.00	250,000.00	30,000.00	5,000.00	782,600.00
Chatham	3,600.00	31,340.00	30,000.00	1,800.00		66,740.00
Cape May	90,000.00	399,460.00	150,000.00	2,000.00	4,000.00	645,460.00
Pearl Harbor	50,000.00	107,280.00	180,000.00	9,000.00	4,000.00	350,280.00
Aircraft Factory and Philadelphia Navy Yard	250,000.00	375,000.00	100,000.00	286,600.00	33,000.00	1,044,600.00
Fleet Supply Base				44,000.00		44,000.00
Great Lakes		30,000.00		600.00	30,000.00	60,600.00
Naval Observatory					40,000.00	40,000.00
Lakehurst	150,000.00	300,000.00	400,000.00	3,000.00	4,000.00	857,000.00
Helium Plant		814,000.00		3,600.00		817,600.00
Dahlgren, Va.	6,000.00	30,000.00				36,000.00
Washington Navy Yard (Wind Tunnel and Engine Testing Laboratory)	15,000.00	50,000.00				65,000.00
Marines						
Quantico	40,000.00	122,412.00	120,000.00	6,000.00	4,000.00	292,412.00
Parris Island	20,000.00	47,235.00	30,000.00	1,200.00	4,000.00	102,435.00
San Diego (Dutch Flats)	12,000.00	56,940.00	50,000.00			118,940.00
Haiti	20,000.00	105,160.00	20,000.00	4,800.00	5,000.00	154,960.00
Santo Domingo	12,000.00	53,172.00	12,000.00		5,000.00	82,172.00
New Projects						
Pacific Coast (Rigid Station)			150,000.00			150,000.00
Miscellaneous						
Clothing				15,000.00		15,000.00
Overhaul of Planes drawn from stores	839,000.00	150,000.00				989,000.00
Miscellaneous (Claims, etc.)	173,166.00	210,000.00	300,000.00	50,000.00	25,000.00	758,166.00
TOTAL SUBHEAD NO. 6	$2,359,766.00	$5,519,264.00	$2,702,000.00	$539,400.00	$206,200.00	$11,326,630.00

GRAND TOTAL SUBHEAD NO. 6 ..... $11,326,630.00

C. Subhead No. 3. To Continue Authorized Construction of One Rigid Airship

Items	*Bureau of C. & R.*	*Bureau of Engineering.*	*Total*
To continue authorized construction of Fleet Airship No. 1.	$750,000.00	$100,000.00	$850,000.00
GRAND TOTAL SUBHEAD NO. 3		$850,000.00	

D. Subhead No. 4. New Construction at Stations

Stations	*Bureau of Y. & D.*	*Bureau of Engineering.*	*Total*
Anacostia	$25,000.00	.....	$25,000.00
Cape May	50,000.00	.....	50,000.00
Coco Solo	392,000.00	$10,000.00	402,000.00
Hampton Roads	170,000.00	8,000.00	178,000.00
Lakehurst	1,160,000.00	100,000.00	1,260,000.00
Pearl Harbor	200,000.00	10,000.00	210,000.00
Pensacola	250,000.00	10,000.00	260,000.00
San Diego	223,000.00	41,000.00	264,000.00
Great Lakes	100,000.00	.....	100,000.00
SUB-TOTAL SUBHEAD NO. 4	$2,570,000.00	$179,000.00	$2,749,000.00
Marines			
Quantico	$100,000.00	.....	$100,000.00
San Diego (Dutch Flats)	400,000.00	$25,000.00	425,000.00
SUB-TOTAL SUBHEAD NO. 4	$600,000.00	$50,000.00	$650,000.00
New Projects. (Proposed Stations.)			
Pacific Coast (Rigid Station) (Including procurement of land)	$1,200,000.00	$250,000.00	$1,450,000.00
SUB-TOTAL SUBHEAD NO. 4	$1,700,000.00	$260,000.00	$1,960.000.00
TOTAL	$4,870,000.00	$489,000.00	$5,359,000.00
GRAND TOTAL SUBHEAD NO. 4		$5,359,000.00	

G. Subhead No. 7. Experimental Work, Development of all Types of Aircraft

Number asked *Items*	*Bureau of C. & R.*	*Bu. of Engineering.*	*Bureau of Navigation*	*Total*
Experiments in regard to launching devices, catapults, arresting gear, etc.	$ 200,000.00	.....	.....	$ 200,000.00
3 Experimental Type A Planes	75,000.00	$ 70,000.00	.....	145,000.00
3 Experimental Type B Planes	90,000.00	80,000.00	.....	170,000.00
3 Exeprimental Type C Planes	150,000.00	100,000.00	.....	250,000.00
Experimental Miscellaneous Construction	175,000.00	.....	.....	175,000.00
9 TOTAL HEAVIER-THAN-AIRCRAFT	$ 690,000.00	$ 250,000.00	.....	$ 940,000.00
1 Experimental Twin-Engine Airship	$ 110,000.00	$ 30,000.00	.....	$ 140,000.00
1 TOTAL LIGHTER-THAN-AIR CRAFT	$ 110,000.00	$ 30,000.00	.....	$ 140,000.00
Combined L/A and H/A Craft				
Experimental research on materials, accessories, etc.	$1,000,000.00	$1,500,000.00	.....	$ 2,500,000.00
To complete miscellaneous experiments uncompleted July 1, 1921	100,000.00	.....	.....	100,000.00
Radio Experiments(Engineering)	.....	.....	.....	.....
Engine Developments (Engineering)	.....	.....	.....	.....
Instruments (Engineering)	.....	.....	.....	.....
Optical Equipment	.....	.....	$ 5,000.00	5,000.00
Aneroid Instruments	.....	.....	3,000.00	3,000.00
Photographic Appliances	.....	.....	10,000.00	10,000.00
Aerological Appliances	.....	.....	5,000.00	5,000.00
Miscellaneous	.....	.....	2,000.00	2,000.00
Total Combined L/A and H/A Craft	$ 1,100,000.00	$ 1,500,000.00	$ 25,000.00	$ 2,625,000.00
TOTAL SUBHEAD NO. 7	$ 1,900,000.00	$ 1,780,000.00	$ 25,000.00	$ 3,705,000.00
GRAND TOTAL SUBHEAD NO. 7			$3,705,000.00	

H. Subhead No. 8. Drafting, Clerical and Technical Help at Stations (Classified Force)	
Grand Total Subhead No. 8	$400,000.00
Grand Total for All Subheads	$35,000,000.00

Aviation Estimates Before Naval Committee

By Capt. T. T. Craven, U. S. N.

Director of Naval Aviation

The Naval Committee has before it an analysis of the estimates for Naval Aviation for the fiscal year 1922. The estimates are divided up and analyzed as has been the case for the past two years and under the same subheads as before. The Department submits a request for a total of $35,000,000.

Four battleships in each fleet have been fitted to convey planes and each of these ships has been equipped with two heavier-than-air machines, which they have flown from the turrets. A number of vessels of various classes are equipped with kite balloon winches and are prepared to operate kite balloons. A kite balloon division has been organized in the Atlantic and in the Pacific to continue development of kite balloon operations.

While material progress has been made with fleet aviation, it must be clearly understood that without the conveniences and the machines permitting the development of aviation afloat with a minimum of effort and inconvenience to ships, the progress of molding aviation into the Naval establishment afloat necessarily will be slow.

The major effort of Naval Aviation was the suppression of the submarine and only toward the close of the struggle did it find a place in the fleet. The supremacy of land aviation put its stamp upon naval thought and until now the effort has been to improvise for naval purposes machines and tactics developed primarily for use over the land. Even the type of machine to be employed from ships can not be the same as that best employed from shore. Those who are unfamiliar with naval subjects and the naval problem can not understand this idea, which is in direct opposition to the view that a United Air Service is either practicable or desirable.

There are certain principles which must be embodied in machines to be used from ships. The first is (a) *Flotation,* which provides reasonable safety for the pilot and for the machine.

Unless flotation is supplied which insures reasonable safety, the development of the tactics of aviation for naval purposes will not proceed, as the commander-in-chief and the commanding officers of vessels employing aircraft will not wish to hazard the aviation personnel in developing the tactical usefulness of aviation in time of peace and in studying the tactical employment of this arm. Consequently, interest in aviation and the application of aviation in so far as the Navy is concerned can not be obtained unless this characteristic is given to naval planes. An effort to compromise the land type of plane by fitting it with air bags for work over water has not been satisfactory as a means for fulfilling naval requirements.

A second quality essential for naval planes is (b) *Ruggedness and dependability,* capable of being easily and quickly taken down and assembled, and when taken down, capable of compact stowage.

The conveyance of planes on the decks or turrets of ships adds one more mental burden to the great load carried by the captain of a naval unit. Planes carried on decks or turrets are very much in the way and one can not expect to find planes in general use from various types of ships until machines have appeared which can be taken down easily and stowed inboard out of the weather and in a way in which they do not interefere with ship activities. It would seem that we must look to metal as material for assisting us to obtain this characteristic. Features which permit the quick taking down and assembly of planes are of far greater importance to the Navy than to the Army.

The third attribute to be incorporated in a naval plane is (c) *Ability to fly from a vessel,* either directly or assisted, and to land on the deck of a vessel or in the water.

The necessity for this characteristic is self-evident and in order that planes may be carried in different types of vessels it is essential that they may get away from the ship with a very short run or that a machine such as a catapult be supplied by which they may be projected into the air. A plane must be fitted to land on a deck or on the water. The land flier is not concerned with these details.

A fourth attribute is (d) *Low landing speed.* It can be readily seen that the closer the speed of a plane approaches the speed of a plane carrier, the ship upon which she desires to land, the easier a landing becomes upon the deck of such a vessel. A plane with an excessively high landing speed can not land upon the deck of a carrier. The importance of low landing speed is supreme for planes to be conveyed in ships of the carrier type.

Having accepted the four above-mentioned characteristics as essentials, we then have a fifth which must be included in order that a machine carried by ships may serve a useful end. Such a plane must be (e) *capable of conveying and of usefully applying military power.* This involves performance, ability to communicate, and the employment of weapons.

It is evident that these characteristics can not be secured without sacrifice to some degree of the high performances now given to the plane of purely a land type, but the Navy must accept this penalty in the aviation arm as it does in all the arms conveyed in surface and subsurface vessels.

In other words, development of naval planes can only be carried on experimentally and it is of vital importance that the operator and the designer work closely hand in hand. Standardization is as yet impossible. The proposition to combine the production of machines for the Army and the Navy therefore is illogical and can only result in delaying the Naval branch in its effort to acquire the apparatus which will permit it to definitely give to aviation the place belonging to it in naval affairs.

Steps to Be Taken for the Procurement of New Types of Machines

The following steps must be taken in order to attack directly the problem in hand by the Navy for the procurement of machines adapted to its use:

(1) Encourage designers to develop planes suitable for naval purposes, through competition or otherwise.

(2) Encourage manufacturers to produce planes of different sizes incorporating the above requirements, through contracts.

(3) Improve and augment the experimental facilities of the Aircraft Factory and enlarge the technical designing force.

(4) Investigate and purchase abroad any types of aircraft which seemingly are well adapted for our purposes.

Funds for experimental work should not be curtailed and pending the development of machines best adapted for use from shipboard planes not so excellent for naval purposes must be supplied in sufficient numbers to permit the development of organization and skill of personnel.

The personnel of aviation during the fiscal year 1922 is

expected to be about 800 officers and 7,000 men in the Navy and 124 officers and 1,100 men in the Marine Corps. At present a total of 631 officers are employed on aviation duty, of whom 362 are aviators and 53 student aviators. We have a total of 60 heavier-than-air and lighter-than-air enlisted pilots and a total of about 7,200 enlisted men employed in aviation duty, of whom 3,000 are at the Training School at Great Lakes.

The station at Rockaway has operated throughout the year. The amount of money spent at this place has been kept low and nothing has been spent on public works beyond what was absolutely necessary for upkeep. The matter of the acquirement by the Government of the land on which the station stands has been taken up with the authorities in New York, but no arrangements have been consummated to this end.

It is evident that it is of great importance to the Government to preserve aviation facilities in the neighborhood of large centers of population. Only through the maintenance of such establishments interest in flying on the part of many individuals who would be immediately useful as fliers in the event of war can be sustained and a reserve of aviators perpetuated.

There has been considerable progress in the completion of the station at Hampton Roads, which during the next year will become our important aviation operating base on the Atlantic Coast.

There is no aviation station south of Hampton Roads within the continental limits of the United States, with the exception of the school at Pensacola. The activities at this place have been augmented considerably during the past few months because of the larger classes which are now being sent there made up of officers of the regular Navy. This is probably one of the most active flying schools in the world.

A small station at Coco Solo in the Canal Zone, established during the war, has continued to struggle on with the limited conveniences supplied during hostilities. The importance of supplying adequate facilities insuring the protection of the Panama Canal would make it evident that a considerable sum should be devoted to the improvement of the aviation facilities in the Canal Zone in the near future. Better provision should be made for the housing of personnel stationed at this post.

On the West Coast, San Diego has been a very active center during the past twelve months, and the importance of this point will increase during the coming year. Up to the present no decision has been reached in regard to the site for the rigid hangar for the construction of which money was appropriated by Congress last year.

The development of the torpedo plane is being undertaken seriously by the Navy Department. In order to carry on this work it is necessary to have flying facilities at places where it is convenient to run torpedoes. During the past year we have endeavored to carry on torpedo work at Yorktown, but in order to insure the progress which we desire, the Bureau of Ordnance is very anxious that facilities permitting the use of aviation should be created near the torpedo station at Newport.

It will be noted that no money, has been requested for seaplanes, as it has been assumed that the planes left over from the stock accumulated during the war will be available for another 18 months. It costs a considerable amount to recondition these machines, but the large boats on hand are well worth this expenditure.

In the estimates presented to the Committee, it will be noted that a total of 67 heavier-than-air planes are requested for the Navy and 61 planes for the Marines. This is a very conservative number. Certainly it would seem impossible for us to do with less were it not for the large number of seaplanes on hand which will also be utilized. A far greater number of heavier-than-air craft than the 128 requested should be authorized.

Lighter-than-air activities everywhere have been very much curtailed. With the commissioning of a tender which will permit the better employment of the kite balloon, greater interest in the use of these units is to be expected. At the present time operations with kite balloons in the fleet are attended with serious difficulties.

The war definitely determined the airship to be primarily a naval unit. The Allied navies found the non-rigid airship to be of value in the anti-submarine campaign in convoy and patrol operations. The Germans demonstrated the usefulness of the rigid as a naval scout, after abandoning this type for offensive overland operations.

The rigid airship in its present state of development has a wide cruising radius and an ability to stay in the air for long periods of time. Owing to the excellent visibility and weather conditions prevailing in the Pacific and West Indian areas, rigids would be of tremendous value in event of war to a fleet operating in these theatres.

The small non-rigids requested will always be useful for coastal work in time of war and are valuable as training units for lighter-than-air personnel. After his course in non-rigids, the pilot should then be competent to begin his instruction in rigid airships. During the coming year, we will have one rigid in operation and one under erection in this country. We can not expect exhaustively to study the usefulness of rigids for Naval work with but two ships of this character and it is to be hoped that the Congress will see fit to continue our development in this line.

The Department has a Giant seaplane under construction. A small amount of money has already been expended on this project from that appropriated for experimental work. The construction of a great ship along the line proposed by the Department is directly in the road of progress and should be continued. A considerable sum is requested for construction of stations, and a considerable part of this sum is to be devoted to construction in the Philippines, at Dutch Flats and on the Pacific Coast rigid station.

Naval Shore Bases

The disinclination to appropriate unduly for Naval shore activities is thoroughly appreciated and unquestionably ideas on this line are entirely correct, but it is submitted in passing that aviation is a new branch which does not fit itself readily into any of the naval shore establishments and bases already in existence, and facilities permitting flying must be created before flying can be conducted. All naval operations of every kind must always be based upon the land. This is true for work with ships as well as aircraft, and consequently any money wisely spent in shore development is a permanent asset and can not be wasted in so far as aviation is concerned.

In the estimates for maintenance of stations, effort has been made to cut, and figures have been based upon actual performances during the past year. The fund for experimental work is believed to be the minimum that should be supplied. The matter of anti-aircraft research and methods for withstanding aircraft attack has recently been investigated by a board in the Navy Department, and it is evident that a considerable sum must be devoted to this important work. The recommendations of this board were not received until after the estimates herein contained had been submitted, but it is believed that the amount requested by the board ($1,000,000) can be covered in the total of $35,000,000 recommended for aviation purposes during this year.

It will be noted that an increase of $125,000 is proposed for drafting, clerical, and technical service. All progressive experimental and design work in aviation has been very much retarded through the lack of trained and skilled technicists. This is particularly the case now that many of the reserve officers, formerly employed in technical capacities, have left the service. Something must be done to enable the Navy to retain adequate technical assistance in order to insure the development of aviation.

Extension of German Air Mails

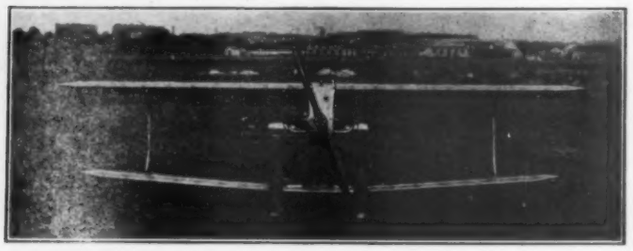
Reports state that the daily air mail between Berlin and Gelsenkirchen is now linked up with the important manufacturing districts within a 20 mile radius of Essen by means of a regular service of motor cycles to which the local mails and parcels are transferred from the airplane by the postal authorities on arrival at the terminal aerodrome. The air mail leaves Berlin at 10 a. m. daily and Essen is reached in 2¾ hours as compared with 10 hours by rail.

The German Air Ministry are endeavoring to make arrangements for the establishment of an airport at Cologne with a view to linking up that city with direct air services to Paris and London.

The Pischoff Avionette

By H. M. Buckwald, M. E.

The airplane that attracted the most attention at the aeronautical meeting at Buc was unquestionably the small Pischoff "Avionette" or Baby Plane. Possessing as it does many new and novel features, it seems to be the right manner of constructing a sport machine. Crowds of spectators, technical and untechnical, military and civil, thronged about this

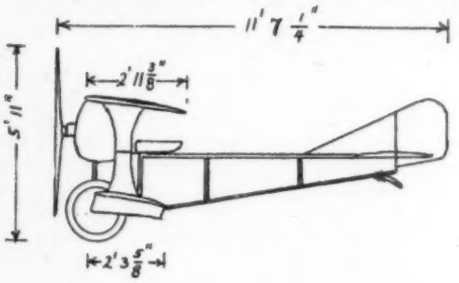


THE PISCHOFF "AVIONETTE" SPORTPLANE

miniature airplane. Moreover they knew that it had real flying qualities, for it had arrived at the aerodrome by the air route and had made an excellent landing.

The most outstanding quality is its simpleity. Seldom before has an airplane been constructed of so few parts, rarely before have single members been put to so many uses and made to answer so many purposes. And as for assembly, two mechanics dismounted and assembled the plane in a couple of minutes. No adjustment of the wings are necessary. The small dimensions, the light parts and the small number of pieces, combine to give it the essential qualties that any sport machine must have: Lightness, ease and rapidity of dismounting and assembly, small space for storage and shipping, small cost and little care necessary for upkeep.

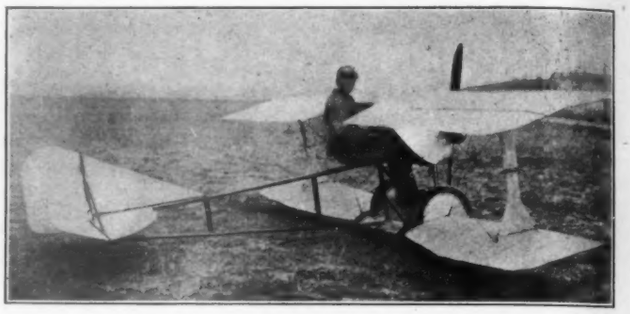
It is a single-seater single-motor tractor biplane, constructed



of steel and aluminum. No wood is used except for the propeller. The covering for the wing and control surfaces is cloth. The factor of safety is 9.

The Wing Cell

The bottom wing is about 8 in. from the ground, while the top wing is only 40 in. higher. The two wings are separated by a single vertical I-strut made of sheet aluminum. The noteworthy thing about this strut is that half-way between the wings, it is cut in two, the upper and lower portions being held together by pins, one on the right side, and one on the left. The interplane strut never becomes detached from the wing to which it is hinged. By splitting this strut, the wings can be taken off the fuselage or reattached in a few seconds. When dismounted the two wings lie one on top of the other, with the collapsed strut between them. The center pin on the wing-tip side is the one that is withdrawn; the strut then hinges about the other. To mount the wing cell, one mechanic holds the wings apart at their extremity. A second mechanic fits the steel-tube wing-spars into the center-section tubes, and then inserts a long pin which passes through the front and rear spars. The cables are attached to the center section, and then the man at the wing-tips pulls up on the top wing and presses down on the bottom one, thus straightening out the strut. The pin that had been withdrawn is then inserted into the strut and the assembly is complete. As a matter of fact, the actual operation takes less time than this explanation.



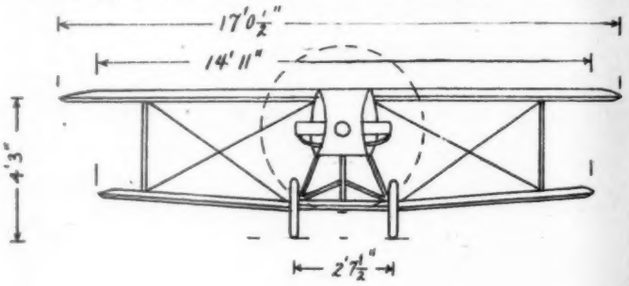
SIDE VIEW OF THE "AVIONETTE"

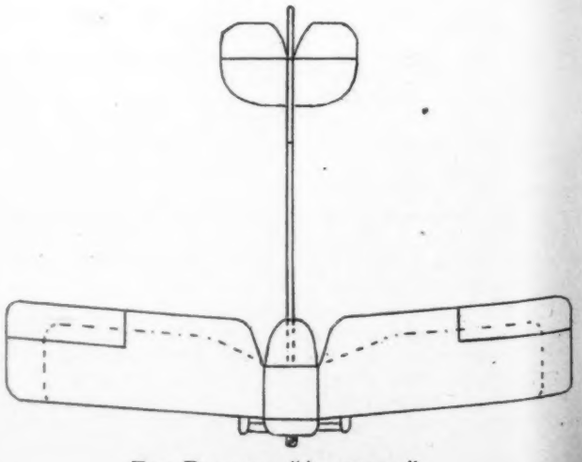
The Landing Gear

There can hardly be said to be any landing gear, the axle of the wheels being mounted directly on the front spar of the center section of the lower wing. No shock-absorbers are used. The total weight of the machine is 385 lb. and loading is small; the landing speed is low; rather large wheels are used, both in diameter and width. Last but not least, the proximity of the lower wing to the ground, eight inches, causes the air imprisoned between the wing and the ground to act as a cushion.

The Fuselage

The fuselage simply consists of two long metal tubes acting as outriggers separated by several vertical tubes. The pilot's



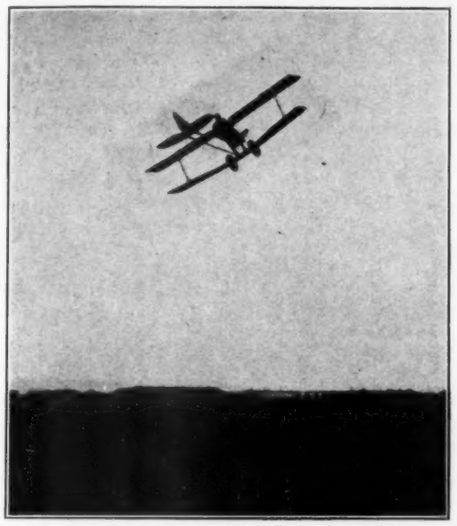


THE PISCHOFF "AVIONETTE"

seat with safety belt, is attached to the top longeron, just in rear of the upper wing which is cut away. Although in appearance the seat is weak, it is really strongly braced. The visibility is very good, and although it is true that the pilot is completely exposed, it must be remembered that this airplane is for sporting purposes and therefore it is not designed for excessive speed or high altitudes.

The Tail

A stabilizer, fin, rudder and elevator, all of conventional type, and constructed of metal tubing, are mounted at the rear of the fuselage. The stabilizer gives a slight positive lift



THE "AVIONETTE" IN FLIGHT

when the machine is in flight. The tail skid is a piece of metal bent at right angles, the horizontal portion, being attached to the bottom longeron by rubber cord.

The Controls

In front of the pilot is to be found a miniature stick control. The ailerons, mounted only on the top, can be worked by the stick, but they return to neutral position by the action of rubber bands in the wing interior. The elevator is connected in the usual manner. The rudder-bar is dispensed with; two pedals revolve on the front spar of center-section of the lower wing. A lug on the inner edge of these pedals is bent up at 90 deg., and to this lug, the rudder cables are attached.

The Power Plant

Mounted directly in front of the pilot is the 16 hp. Clerget-Blin 2-cylinder horizontal air-cooled engine, with fuel tank and propeller. The top of the fuel tank is level with the upper wing. Here is to be found the only instrument, a tachometer, together with an oil pulsometer and ignition switch. The throttle lever is attached to the joy-stick, and is connected to the Zenith carbureter by a Bowden cable. The R. B. magneto is oscillating, and therefore gives a maximum spark at retard or advance.

Specifications

GENERAL DIMENSIONS

Span, upper	17 ft. 0½ in.
Span, lower	14 ft. 11 in.
Chord, upper	2 ft. 11⅜ in.
Chord, lower	2 ft. 3⅝ in.
Aspect ratio, upper	5.8
Aspect ratio, lower	6.5
Gap, at fuselage	3 ft. 3 in.
Height, ground to top wing	4 ft. 3 in.
Height, ground to propeller tip	5 ft. 11 in.
Overall length	11 ft. 7¼ in.
Stagger	0 deg.
Backsweep, upper and lower	4 deg.
Dihedral, upper	0 deg.
Dihedral, lower	4 deg.
Angle of incidence, upper	5 deg.
Angle of incidence, lower	3 deg.
Decalage	2 deg.
Wing Curve	Courtois-Suffit

AREAS

Upper plane, including ailerons	53.5 sq. ft.
Lower plane	27 sq. ft.
Total wing surface	80.5 sq. ft.
Ailerons, total	7.7 sq. ft.
Stabilizer	4.9 sq. ft.
Fin	1.75 sq. ft.
Rudder	3 sq. ft.
Elevator	3.5 sq. ft.

FUSELAGE

Height at front	24 in.
Height at rear	12 in.

LANDING GEAR

Diameter of wheels	1 ft. 9⅝ in.
Width of tire	3 in.
Tread	2 ft. 7½ in.

POWER PLANT

Engine	2 cylinder horizontal air-cooled Clerget-Blin.
Power	16 hp.
Bore	3⅝ in.
Stroke	3 15/16 in.
R.p.m.	2100
Weight	55 lb.
Weight per hp.	3.44 lb.
Gasoline consumption per hour	1.85 U. S. gal.
Fuel tank capacity	3.7 U. S. gal.

PROPELLER

Make	Lumiere
Diameter	4 ft. 11 in.
Pitch	2 ft. 1½ in.
R.p.m.	2100
Direction	Right-hand

WEIGHTS

Weight, empty	224 lb.
Weight of fuel	21 lb.
Weight of pilot	140 lb.
Lift loading (80.5 sq. ft.)	4.8 lb./sq. ft.
Total weight	385 lb.
Power loading (16 hp.)	24 lb./hp.

PERFORMANCE

Maximum speed	56 m.p.h.
Minimum speed	34 m.p.h.
Climb	2600 ft. in 19 min.
Climb	6500 ft. in 52 min.
"Unsticks" in	150 ft.
Lands in	80 ft.
Gliding angle	1 in 4.5
Range of action	2 hours.

The California Air Tournament

One of the big events of the year in aviation was the National Winter Air Tournament, Show and Races held at the Daugherty Municipal Flying Field, Long Beach, Cal., December 25, 26 and 27. Over one hundred thousand people were present and witnessed the events, ten thousand being on the field.

The principal event was the 100 mile free-for-all race for the Hayes Trophy and $400. This was won by Lieut. E. C. Batten of Crissy Field in a LePere with a Liberty-12 engine. He made a speed of 146.4 m.p.h. for the course. Capt. L. H. Smith of Mather Field came in second with a Hall-Scott Fokker. Lieut. Harold Brand of March Field was third in a DeHaviland. In this event there were 13 starters.

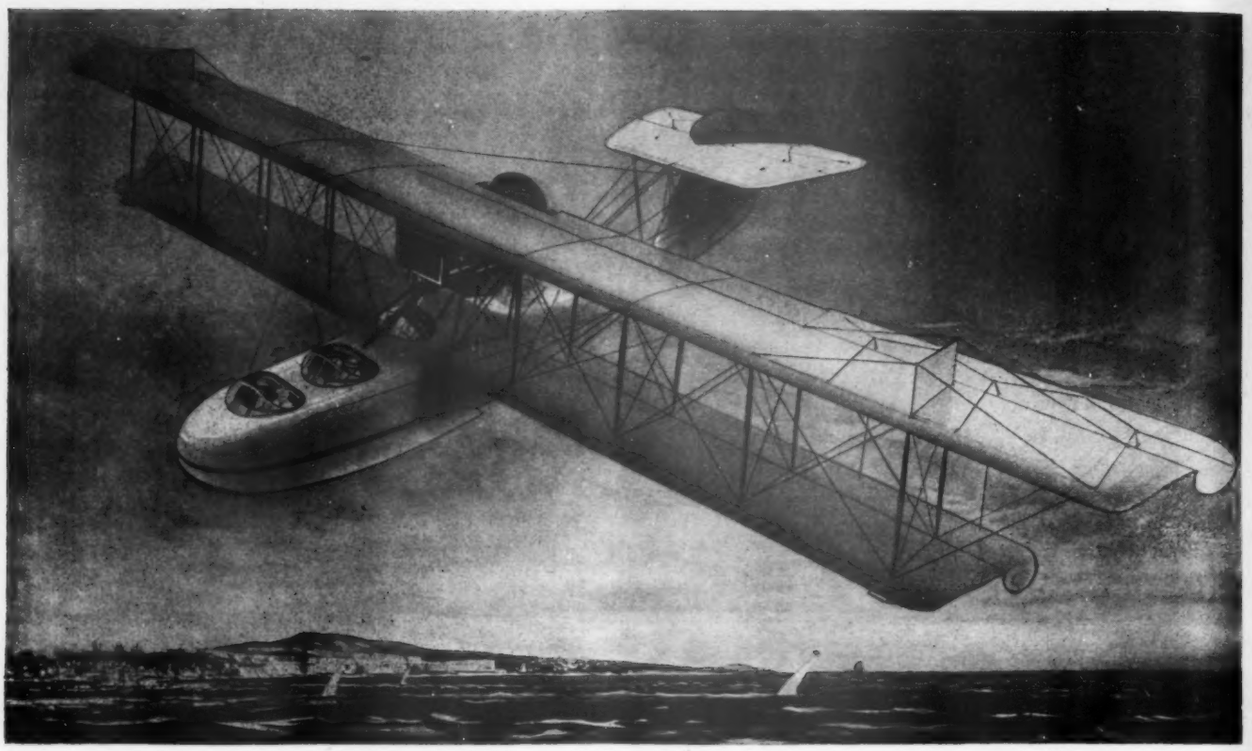
In the 60-mile handicap race, A. W. Smith of March Field won in a Curtiss JN-6. His elapsed time was 33 min. 37 sec. and his handicap was 19 min. 29 sec. Emery H. Rogers in a Canadian Curtiss was second and W. D. Timm in a Barnhart airplane was third.

The eight mile balloon race held on December 27 was won by the Navy, beating a Goodyear pony blimp by one hundred feet. The race was between the Navy airship B-18 and two pony blimps, one belonging to the Army and the other to Marshall Neilan, motion picture producer.

The out-of-door ground show was particularly interesting. Both the Army and Navy contributed exhibits of airplanes and equipment. The entry list included the "Pacific Hawk," the Friesley passenger biplane and the new Davis-Douglas "Cloudster" designed by Donald Douglas. All three of these machines were built in California.

The conduct of the race was admirable and the rules were written with safety as a major consideration. No planes were allowed on the field unless they were contestants. Each machine was assigned a parking place and was required to stay at it unless in the air. After the finish of the race, the pilots were required to fly straight ahead and climb until they had reached an altitude of 2000 ft. and then land when the field was clear. In order to avoid starts being made from a dive, the time was taken as the machine crossed the starting line whether they had left the ground or not. The maximum altitude for the course was 500 ft.

Moose Factory To



Aeromarine Navy HS2L Open Cockpit—Model-85

PRICE $6500, IMMEDIATE DELIVERY

This is the celebrated HS2L Navy Coast Patrol Flying Boat converted to meet the requirements of aerial photography, forest patrol, timber scouting, surveying and mapping, locating schools of fish for commercial fisheries, fire patrol, etc.

Opposite is described remarkable feats of this particular model. To encourage commercial aviation the U. S. Government has chosen The Aeromarine Engineering & Sales Company as a channel through which you may be allowed to purchase these beautiful boats at less than one third of what it cost to build them.

Aeromarine

Aeromarine Service Includes the

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1800 TIMES BUILDING PHONE BR 4505

ochrane In 2 Hours!

Instead of 3 weeks of hardships experienced by the Navy Balloonists

Last July the Canadian Government sent an expedition to make aerial photographs and surveys of the territory lying between Cochrane, the northernmost railhead, and the Hudson Bay.

This expedition had at its disposal the best aircraft produced by any of the Allied Powers, but finally selected for this perilous trip a U. S. Navy HS-2 Coast Patrol Flying Boat.

They flew from Toronto to Cochrane over the northern wilderness, and then made eight trips from Cochrane to Moose Factory, Mattice, James Bay and Hudson Bay.

The flying time from Cochrane to Moose Factory was two hours—a trip that requires from three to six weeks by dog sled and canoe.

Although they flew thousands of miles, the perfect performance of this Navy HS-2 Flying Boat fully justified these experts in their selection of it as the type of aircraft best fitted to meet such a rigid test.

All over the country individuals and corporations are making big profits operating flying boats for passenger carrying, sight-seeing, aerial photography and other purposes.

This opportunity to buy one of these brand new, thoroughly reliable boats enables men of vision to start an aerial transportation company and purchase their equipment now, at one-third of what it can be purchased for later.

There are numerous points where aviators have made $500 to $1000 per week in passenger carrying in two and three seat machines. With one of these six seat boats the profit opportunity is doubled.

Write for our easy payment plan.

Unconverted boat, $6160.

Open cockpit six seat boat, $6500.

Enclosed cabin de luxe six seat flying limousine, $9000.

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NEW YORK CITY

S. A. E. Annual Meeting

The Society of Automotive Engineers held its Annual Winter Engineering Conferences and Dinner January 11, 12 and 13. The retiring president, Col. Jesse G. Vincent, arranged for several interesting aeronautical conferences which were attended by many of the most prominent aeronautical engineers.

At the first conference on January 11, papers were read by Grover C. Loening; Major Harold Martin, who read a paper prepared by Major Thurman H. Bane who was prevented from attending owing to illness; C. D. Hanscom; chief engineer of the Glenn L. Martin Co., and F. W. Caldwell, propeller expert of the Air Service. All of the aeronautic conferences were presided over by Glenn L. Martin, vice-president of the S. A. E.

At the afternoon meeting held on January 12, papers were read by Glenn L. Martin, president of the Glenn L. Martin Co., Ralph H. Upson, well-known authority on lighter-than-air craft and formerly of the Goodyear Tire and Rubber Co. and Prof. E. P. Warner of the Massachusetts Institute of Technology and of the National Advisory Committee for Aeronautics.

Commercial Aviation in Europe

An aerial taxi-cab in London costs approximately the same as an earth-bound taxi in New York, Prof. E. P. Warner stated in his paper, "Commercial Aviation in Europe." The charge in England for an aerial taxi is 2s. 6d. or 44 cents for two persons per mile, and an airplane can usually be had at an hour's notice. This fare is only two and one-half times as large as that for an earth-bound taxi in London and costs approximately the same amount to travel by airplane in England as by taxi-cab in New York.

Prof. Warner said the actual costs of air travel in Europe have shown a tendency to steady reduction. He asserted the fare charge on the London-Paris route was originally 20 guineas but has since been decreased several times, and now stands at 10 guineas ($37.00) for the one way journey and 18 guineas for the round trip. The fare to Brussels is the same while that to Amsterdam is 15 guineas one way. He said that figures had been compiled and presented to the Air Conference in London last September, showing that large planes could operate profitably carrying passengers between Paris and London for £5, 10s. ($19.50 at the present exchange,) if the machines could carry a full load on each trip.

He said that statistics compiled showed that during the first eleven months of commercial flying in England, between England and the continent, there was a tolal of 24 accidents, four of which resulted in the death of one or more occupants of the airplane. The pilot was killed in all four cases, while, in the whole eleven months one passenger was killed. The average death rate among pilots was 0.415 per thousand hours or one death for every 2,410 hours of flying, while the average among passengers was 0.015 fatality per thousand passengers carried and .055 per thousand passenger hours.

This works out roughly as one death for every 67,000 passengers and every 18,200 passenger hours or, taking the average cruising speed of commercial aircraft as 90 m.p.h., as one fatility for 1,640,000 passenger miles. During the year 1917, the passenger death rate for railroad travel in the United States, was one for every 3,220,000 passengers carried, a danger ratio of 48:1. In some years American railroads have shown themselves less than 20 times as safe as has the airplane in this, its first year of commercial use.

Prof. Warner also brought out the interesting fact that no European country operates its own mail planes, as has been the practice here, The mail operating companies are privately conducted and receive a fixed fee from the government. He said there are several forms which government assistance to commercial flying may take. "It may be extended through direct purchase of airplanes for the military establishment, or for some other branches of government, as is the case here," he said. "Secondly it may take the form of a direct subsidy of the industry by the grant of monetary assistance to operating companies instead of to manufacturers, on a basis of services actually operated, as has been done by the French government, or instead of granting any direct assistance to firms engaged in tthe manufacture or operation of aircraft, the government may offer indirect assistance by furnishing the ground organization for the services and by encouraging research aiming to obtain fundamental data for the production of more useful and more economical aircraft." He added that the British government had chiefly adhered, up to the present time, to the last method.

In conclusion, Prof. Warner said insurance rates at the present time in Europe are about 30 per cent per annum for passenger aircraft traveling over good country, with a reduction of one-fifth of a per cent on the face value of the policy for every hour of flying after the first hundred hours.

Transportation of the Immediate Future

"If your time is worth more than $8,000 per year you really can't afford to travel long distances by railroad train," according to Ralph H. Upson. He declared that regular aerial passenger and express carrying lines merely awaited the equipment and the necessary terminal facilities, namely, landing fields. Mr. Upson's paper was entitled "Transportation of the Immediate Future" and in it he said that every present day indication pointed to the fact that in a comparatively short time all passengers will travel by air when the distance to be traversed is more than 100 miles.

"This very desirable condition does not depend upon any radically new discoveries" he said. "It will come from designs that are suited to the purpose, and from a realization by the American people that suitably located terminals and air harbors must be provieded for."

In explaining why a man earning more than $8,000 a year can't afford to travel any great distance by train, Mr. Upson said that between here and Chicago such a man lost $50 of his actual salary earnings by taking a part of two days for the journey. "This makes a $100 loss for the round trip, to say nothing of the loss of business efficiency incidental to the hardships of such a journey. When he travels to Chicago in one night, comfortably sleeping in a noiseless almost motionless airship he will lose no money from his earning day and none from the effects of his journey."

He added that the future success of both airplane and airship lines depends on fundamental economics, namely; (1) mileage cost per unit weight and (2) the time value of the cargo or passengers carried. He expressed the belief that the time was not far distant when these figures would permit competitive rates between railroads and aircraft.

The Annual Dinner

At the annual dinner held at Hotel Astor on January 13, several of the speakers referred to the possibilities of commercial aeronautics and urged the engineers of all automotive branches to interest themselves in aviation.

"In my opinion, we—and I mean by 'we' the United States Government and all the citizens of this country—should adopt a consistent, forward-looking policy, amply supported by legislation which will ensure the immediate and vigorous growth of commercial aviation in the United States," declared R. E. M. Cowie, vice-president of the American Railway Express Co.

He went on to say that he saw no reason why the United States Government should not give as much support to commercial aviation as it does to navigation, and that he believed that for the safety of this country, for its defence in time of war, and for its continued commercial prosperity, it was absolutely imperative that a system of commercial airplanes be developed which could be readily altered in two or three days so as to become effective weapons of war.

"If the occasion should arise when a large number of airplanes should be needed by the Government, either for commercial purposes or war, where could it get them today? What provisions have been made for night flying? How many landing fields have we that are suitably marked, lighted, supplied and equipped with directional wireless and all the

other necessary aids to successful air navigation?" queried Mr. Cowie. "Why should not the Government," he urged, "control this in the same manner as it does our merchant marine, by providing laws, licenses, suitable light-houses, maps, proper routes, life-saving apparatus, licensed pilots and all the other things that go to make up a successful working organization? We have none of these today and although America is the home of the airplane, and we have among our engineers some of the best designers and manufacturers of aircraft, nothing of importance seems to have been done to conserve the valuable aeronautical assets which we have. I regard as very unfortunate this lethargic attitude of the United States Government toward aviation. While I do not wish to go on record regarding a separate air service, yet I do, as a transportation man of experience, wish to emphasize the great necessity for the immediate encouragement of commercial aviation."

" I am a great believer in the future of aviation," concluded Mr. Cowie, "and I believe the more we get behind it the more automotive vehicles of all kinds will be manufactured and sold. This country of ours is a great country of vast distances and unexplored resources, but it is a country where transportation is a paramount issue, where the transportation cost of articles makes up a large part of the selling price. For that reason, there lies in your hand a vast and far-reaching opportunity."

David Beecroft, editor of *Automotive Industries* was elected president for the ensuing year.

The Nephoscope and Aviation

Improved and completely equipped nephoscopes, like that shown in the accompanying photograph, for determining the cloud direction and apparent velocity of movement, are being installed at one hundred stations of the United States Weather Bureau, distributed over the country. The instrument was designed by the officials and instrument makers of the Bureau, and manufactured by a well known instrument maker. Observations from these instruments, already begun at many stations, at morning, noon and evening and on special occasions, will aid the officials of the Bureau in making forecasts, particularly of wind velocity and direction aloft for air navigators.

The instrument consists chiefly of a black horizontal mirror, rigidly mounted and properly oriented, in which the cloud image is observed through an eye-piece a few inches above the surface of the mirror. An eye-hole, a mark at the center of the glass mirror, and a point selected on the cloud image, which may be any place in the sky excepting near the horizon, form the starting point in making the observation. The frame of the mirror is graduated in degrees and the point at which the image leaves the mirror indicates the direction the cloud is moving. Directions are always recorded as that from which the cloud is moving, the same as wind direction records.

The eye-pieces are adjusted accurately at a measured distance above the mirror, hence the distance traversed by the cloud image measured on the face of the mirror, in a definite number of seconds, is a basis for calculating triginometrically the apparent or nephoscopic velocity of the cloud. A fairly accurate estimate of cloud altitude, for most purposes, can usually be made from a study of the form and texture of the cloud, after some experience, and thus a usable estimate of the velocity is ascertainable with no other equipment.

A Nephoscope in Use

However, at a number of Weather Bureau stations pilot balloons are released daily into the upper air and followed with a theodolite, readings being made at intervals of a few seconds. The hydrogen gas used for inflating the balloon has a constant lifting power and thus the balloon has a constant known rate of ascent. By noting the number of seconds required for the balloon to lose itself in the cloud, the cloud altitude is rather accurately determined. The theodolite record of direction and rate of change with altitude gives valuable data on wind velocity and direction aloft also, beneath the cloud level.

A more accurate knowledge of the velocity and direction of winds aloft can be ascertained by means of the more accurate study of the upper cloud movements; and a knowledge of the location, the height, thickness, density, and direction of movement of the cloud fields over the flying routes should prove of great value to fliers. In hilly country, and especially in the mountains of either the east or the west, the cloud fields and banks very frequently, in cold weather, float far below the peaks, and often well down onto the surfaces of the higher valleys, obscuring the greatest of all dangers to the aviator. By means of the Weather Bureau's interchange of reports over the country, and the wireless control stations of the U. S. Air Mail Service, it is expected that an aviator may have at hand before starting on a journey a fairly good idea of the clouds and currents he will encounter.

General Nivelle Sees Two Miles of Planes at Kelly

When the first sentry at Kelly Field saluted Gen. Robert Georges Nivelle word was passed to the waiting airmen. As General Nivelle's car rounded Hangar No. 1, he saw a line of ships that stood wing to wing from Hangar No. 1 to No. 24. A line of S. E. 5's, De Havilands, Fokkers, Spads, Curtiss JN-6-H's, Capronis and Handley Pages, every plane in working order with its crew and pilot lined up in front.

The General rode down the entire line. When he returned to the reviewing stand the word of command was given and the big line of pilots and mechanics simultaneously broke, and from Hangar No. 1 the bark of a single S. E. was the signal for the entire line of ships to "come to life," and they did. Three minutes later there was not a single dead engine on the line, and the First Pursuit Formation was already out on the field ready to take off. They were followed by three other S. E. formations; then the De Havilands rounded off. The formation circled the field and passed over the reviewing stand. The highest formation was 2000 feet; the lowest 500.

After the exhibition, a tea was given at the Aviation Club in honor of the General.

Navy Releases Aircraft Material

The Navy Department has released to the public a large quantity of seaplanes, engines and equipment at prices which are so low that they ought to attract many purchasers. The Aeromarine Plane and Motor Co. has been authorized to sell one hundred and twenty-five coast patrol flying boats at about one-third of their actual value, believing this will encourage the development of aerial transportation companies throughout the country, and the more general use of aircraft for business purposes, such as mail, passenger and express carrying, surveying, etc.

A HS-2-L Flying Boat

The Navy Department believes that inasmuch as one of its first lines of defense in the future will be in the air that every legitimate effort should be made to create commercial flying organizations so that trained men will be available when needed.

One of the chief obstacles in the past to the formation of such aerial transport organizations has been the rather high cost of reliable equipment, but with the Navy cooperating in this broad guage manner by authorizing the sale of HS-2-L flying boats equipped with the 400 hp. Liberty engine for $6160. each which is one-third of their actual cost, it means that commercial aviation in this country will be able to keep abreast of foreign progress.

These boats are considered one of the best types developed by the Navy and many have been converted into splendid six-seat open cockpit passenger boats or six-seat enclosed cabin boats. When converted into passenger carrying craft they afford an ideal means of quick, comfortable and safe transit for the busy business man from his city office to his country home, and as they are used to fly over water a safe landing place is always available.

Many other types of seaplanes and land planes, engines and equipment are offered direct to the public. Proposals for purchase must be made to the Bureau of Supplies and Accounts Navy Department, Washington, D. C. Sales will be made to the highest bidders conforming to the requirements of the schedule, when the bids are above the appraised values. When bids are below the appraised values, they may be or may not be considered. The Navy reserves the right to reject any or all proposals in whole or in part. The bids will be decided by lot, or mutual agreement of the bidders. Proposals will be received for all or for a part of each lot. Bidders will state the quantity desired with the unit price bid.

The flying boats, seaplanes, engines, spare parts, and accessories will be checked by a representative of the Navy at the point of shipment. The purchaser is requested to have a representative present to witness the checking and to inspect the seaplanes, etc., before shipping as no claims for shortage, quality, condition or inaccuracy in description will be approved after delivery.

A deposit of 10 per cent of the total amount bid must accompany the bid as surety for payment of the balance and removal of the material within 30 days after date of award. Such deposit will be forfeited to the United States in event of failure of bidder to carry out the terms of his proposal if accepted. Deposits must be in certified check drawn to order of the Paymaster General of the Navy.

The following list of equipment is also offered for sale direct to the public:

Used F-boats with Curtiss OXX-6 engines. Location: Naval Air Station, Pensacola, Fla. Sale price—$1,200.00. These planes have been used, and engines, radiators and propellers have been removed. Engines, however, have been assigned to the boats and radiator and propeller will be furnished with each boat sold.

51 new Areomarine type 39-B seaplanes and 11 sets spare parts for Aeromarine 39-B. Location: Naval Aircraft Factory, Navy Yard, Philadelphia, Pa. These planes have never been unpacked from original packing cases. Were received during fall and winter of 1918 and are available for export. There is a large quantity of wing panels, stabilizers, rudders, elevators, struts, wires and fittings and other parts for Aeromarine 39-B seaplanes, in storage at the Naval Aircraft Factory, Navy Yard, Philadelphia, and at the Naval Air Station, Pensacola, Fla. This material is available for sale and any reasonable offers for same will be accepted. This material is listed in order that purchasers of this type seaplane may obtain needed parts for replacements. Approximate cost of Aeromarine 39-B plane and engine $9,687.73. Sale price, $3,000. Approximate cost of Aeromarine 39-B set spares $8,180.00. Sale price, $2,500.

4 Aeromarine model 40 flying boats and 4 handling trucks for model 40. Location: Navy Supply Station, Hampton Roads, Va. These planes are available for export. Model 40 flying boat, sale price, $4,000. Handling trucks for model 40, sale price, $100.

30 new MF-boats. Location: Naval Aircraft Factory, Navy Yard, Philadelphia, Pa. The boats have never been removed from the original crates and are in excellent condition. Sale price, $3,000.

7 overhauled Burgess N-9 seaplanes. Location: Naval Air Station, San Diego, Cal. Approximate cost, $10,000. Sale price, $1,500.

45 new Boeing seaplanes with Hall-Scott 100 hp. engines and 45 handling trucks for Boeing seaplanes. Location: Naval Air Station, San Diego, Cal. The boats have not been removed from original crates, and are in excellent condition. Cost (approximately) $10,300. Sale price, $2,000. Handling trucks, sale price, $100.

7 Standard scout airplanes. Location: 4 planes; Paris Island, S. C.; 3 planes, Hampton Roads, Va. These are land machines purchased from the Bureau of Aircraft Production. These planes are practically the same as when they left the factory and are in excellent condition, subject to deterioration due to storage only. Cost, $7,867.73. Sale price, $1,000.

10 new type R kite balloons. Location: Naval Aircraft Factory, Navy Yard, Philadelphia, Pa.. Cost, $7,500. Sale price, $2,500.

The engines consist of 34 Curtiss OXX-6 engines (used), 3 Curtiss OXX-3 engines (used), 2 Curtiss OXX-6 engines (used), 1 new Hall-Scott A-7-A engine, 8 Hall-Scott A-7-A engines (used), 6 Curtiss OXX-6 engines (used), 3 Curtiss V-2 engines (used), 57 Curtiss V-2 engines (used), 24 Hall-Scott A-5-A engines (used), 17 Sturtevant engines (used), 6 Sturtevant engines, 11 Hall-Scott A-7-A engines (used), 2 Thomas engines (uesd), 3 Wisconsin engines (used), 21 Curtiss OXX-3 engines, 78 Curtiss OXX-6 engines, 3 Curtiss OXX-2 engines (used), 1 Curtiss OXX-6 engine (used), 1 Curtiss OXX engine (used), 4 Gnome engines (new), 23 Gnome engines (used), 85 Liberty engines (used), 26 Fiat engines. With these are some engine spare parts, many spark plugs and miscellaneous propellers. The prices of the engines range from $125 to $900, according to condition.

Balloons Instead of C. A. C. Observation Posts

The Fourteenth and Twenty-fourth Balloon Companies have been conducting certain Air Service experiments at various Coast Artillery and Heavy Artillery posts along the Pacific Coast. It may be of some interest to the public in general and the service in particular to be informed as to what has already been accomplished, what is desired and expected, and the methods used.

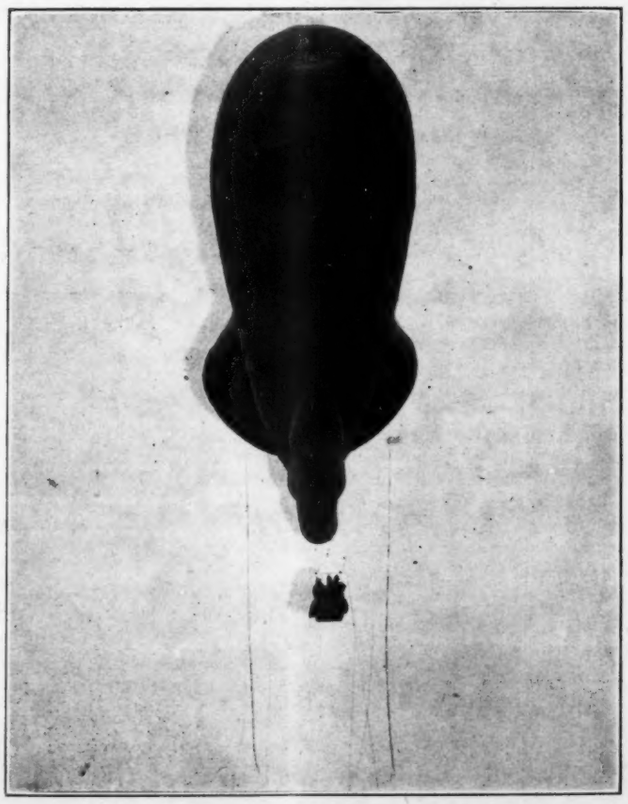
These balloon companies left the United States Army Balloon School, Fort Omaha, Neb., on April 10, 1920; the Twenty-fourth Company commanded by 1st Lieut. F. J. Durrschmidt, A. S., and 2nd Lieut. James T. Neely, A. S.; and the 14th Company commanded by 1st Lieut. W. C. Burns, A. S.; and 2nd Lieut. Joseph A. Physioc, Jr., A. S. Their first destination, San Francisco, Cal., was reached on April 14 and the companies were stationed with the coast defenses of that city, the Fourteenth at Fort Funston, and the Twenty-fourth at Fort Barry. During the three weeks at this location no results in air work were obtained, the time being spent in choosing suitable locations for permanent buildings for balloon garrisons, and in a study of the Coast Artillery systems and the nature of the work involved.

For Coast Artillery purposes, firing at a moving target, it is required that the balloons be able to "track" the target as well as spot the shots. The spotting of shots on water is of course a matter of training and judgment of distance which can only be satisfactorily accomplished after experience in that work, this, however, entailing no essentially new departure from the observation work usually done by balloons. The "tracking" of targets was an entirely new problem and one for which there had been no instrument developed.

A board of officers met to discuss the question and after several suggestions an instrument was finally devised for trial. The system upon which the work was attempted is known as the "horizontal base-line system". The balloons are established at opposite ends of a horizontal base-line of about 8,000 to 13,000 yards in length. With the instrument provided each balloon reads the angle between the other balloon and the target at a given time (Time interval bell). This is done every minute and the "track" of the target is plotted on a "balloon plotting board".

Without going into undue details the instrument may be described as a 1900 azimuth instrument and base mounted on a metal arm containing a fixed telescope. The whole instrument is suspended from the rigging above the basket and one observer keeps the telescope on the other balloon while a second observer tracks the target with the azimuth instrument. After a month of this work the results gave great satisfaction, the balloon having tracked targets at a range of 15,000 yards and obtaining tracks which, when checked by the Artillery ground observation posts were found to coincide within an error of about 20 yards in range and about .02 of a degree in azimuth. These results were considered exceptionally good especially considering the unstable character of the basket and the crude stage of all the appliances used.

The companies were then ordered to Camp Lewis, Wash., making the trip by truck-train over the Olympic highway. At the end of September the companies returned to their previous stations at San Francisco and resumed work with the coast defenses. During the last three weeks of October a great many tracks were made which showed constant improvement and checked satisfactorily. During these three weeks each officer of both companies had more than 41 hours in the air, all of which time was consumed in actual work with the Artillery. The constant improvements were due to various additional devices making for greater accuracy more notably on the balloon plotting board and in the location of the balloon baskets at the time of each reading, and in the increased efficiency of the personnel with experience.



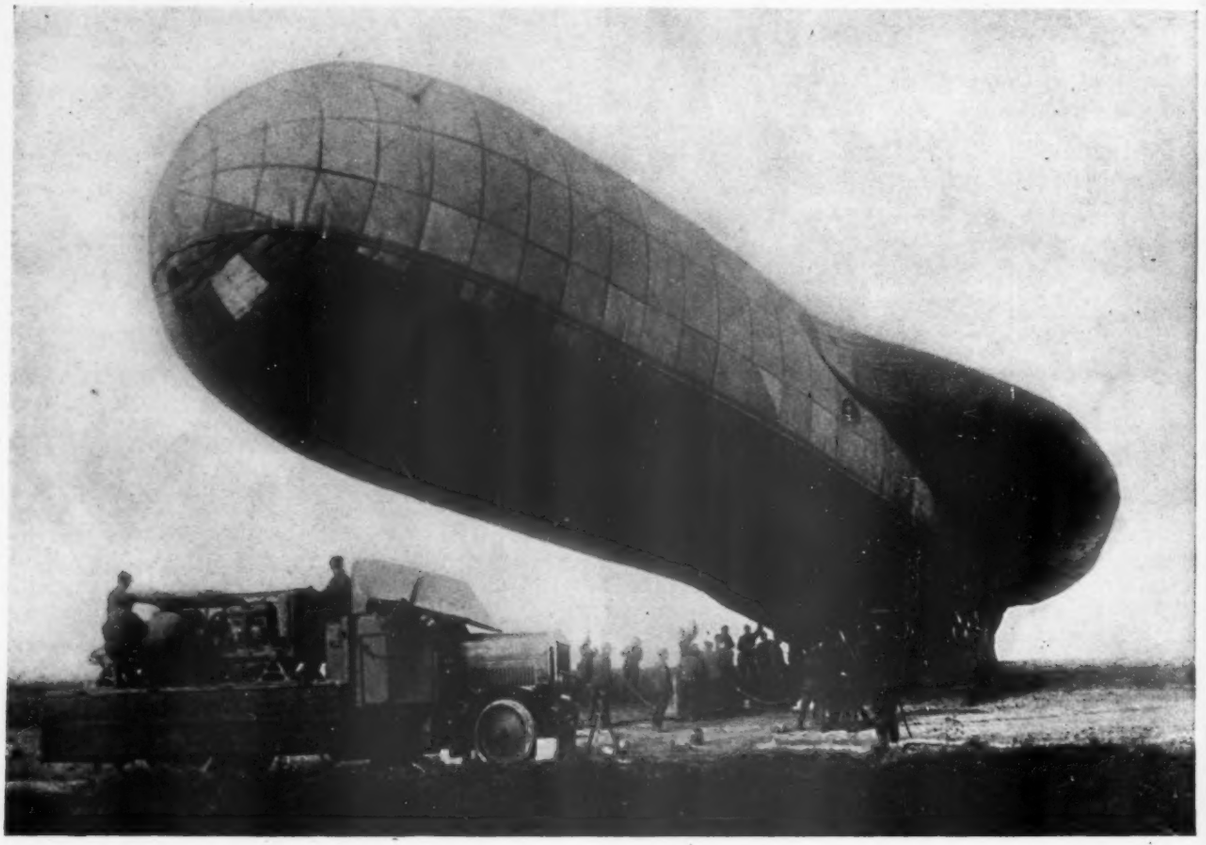
A Caquot K. B. Aloft

Finally, after elaborate preparations, a problem was fired for the first time in the history of the service, in which all data was supplied form the air by balloons. On Wednesday, November 24, Battery Mendell (12 inch disappearing guns) fired 22 shots at a pyramidal target with an approximate range of 14,000 yards, the target being towed by a tug with a tow line of 500 feet. The tracking and spotting was done by balloons and the data obtained from the bal-

loon plotting room. No direct hits were obtained on the pyramidal target but had it been actual service conditions with a ship as the target at least five of the shots would have been direct hits, not including several probable ricochets.

The firing was case 11, with the gun pointer doing the pointing, and the shots were all well grouped. The group was as satisfactory as any obtained this year with ground data and the last four shots from number 2 gun had the range correct, but were off in deflection due to the faulty pointing of the gun. This work is still in its more or less primary stages and a lot remains to be done in the matter of accuracy and speed. However, these results have laid a foundation upon which future improvements can be built with lasting and definite advantage to the Service.

The regulation Coast defense firing by balloons will be especially advantageous in this locality where haze and fog frequently ruin the visibility of the ground stations. Quite often this condition does not exist more than 15,000 to 20,000 yards out to sea and the balloons could thus go above the fog and see beyond it with perfect accuracy. With good visibility sizable ships can easily be tracked a distance of twenty-five miles from shore. The advantage of this is apparent. It is believed that for future work of this nature each balloon should fly with two baskets, one basket containing two observers and the tracking instrument, and the other basket containing the Fire Commander or some such officer properly trained in air work who can spot shots, assign targets, transmit intelligence, etc.



A Parseval Kite Balloon

Reserve Commissions for Flying Cadets

Authority has been granted the Air Service to offer commissions in the Officers' Reserve Corps, inactive status, to flying cadets appointed from an enlisted status who do not desire their discharge under the provisions of the act of July 11, 1919, and revert to the grade held by them prior to their appointment as flying cadets. Appointment to the O.R.C. will be made after successful completion of their training.

National Aircraft Underwriters Association Seeks Data

The National Aircraft Underwriters Association, 132 Nassau St., New York, is endeavoring to obtain reliable data regarding the characteristics of the land over which airplanes fly along established air routes in this country. The Association would appreciate it very much if pilots would provide them with as much data as they can regarding the condition of the land over which they have had the opportunity to fly.

The reason for wanting this data is that the insurance companies that are affiliated and are now writing aircraft insurance desire to be able to judge more fairly what premium to charge persons applying for coverage for different risks over different territories. An idea of what information is required may be gathered from the following question:

What route are you describing?

Is the ground rocky and dangerous to land on along this route?

Is it swampy or marshy, or cut up in any way that would affect a safe landing?

Is it woody or hilly?

Are there many large fields in which a plane could land safely?

What is the average size of the fields along the route described, wherein a plane could make a safe landing?

What are the names of the principal airdromes along the route?

How many and where are the depots from which supplies (spare parts, gas, oil, etc.) can be obtained?

In your opinion, which are the most dangerous spots along the route, and would a cross-country pilot have any difficulty in finding a safe place to land, or are there good landing fields all along the route?

With this data and any other that pilots are able to supply in addition to helping the insurance companies, the companies will be in a position to provide any pilot contemplating a cross-country flight with much useful information upon request.

Aviation Facilities Around Puget Sound

The only establishment in the Thirteenth Naval District equipped for and competent to make extensive repairs to aircraft is the Boeing Airplane Co., Seattle, Wash. The J. W. Miller Aircraft Co., Green Lake Boulevard, Seattle, Wash., has a small shop and makes minor repairs on aircraft. Gasoline can, of course, be obtained almost anywhere between the Cascade and the Olympic Mountains. Oil suitable for aircraft is harder to get.

Seaplanes can land anywhere in Puget Sound, Lake Washington, Gray's Harbor, Lake Keechelus, Willapa Harbor, and the Columbia River.

For land planes, the parade ground at Camp Lewis is excellent. Spokane has two excellent fields. King County, Wash., has bought and is improving 219 acres at Sandy Point on Lake Washington.

Routes from Seattle to Portland

It is the opinion of aviators experienced in flying in this section that the best route for a seaplane between Seattle, Wash., and Portland, Ore., is up Puget Sound to Olympia; then westward until the Chehalis River is reached; down the Chehalis River to Gray's Harbor; thence either over the Pacific or Willapa Bay to the mouth of the Columbia River; then up the Columbia River.

On this route it is necessary to attain an altitude of 10,000 ft., consequently craft not able to get so high should not attempt it.

In the reverse direction Mount Rainer should be headed for after leaving Gray's Harbor until the Sound is sighted.

An alternate route is to follow the Sound and Juan de Fuca Strait until in the vicinity of Clallam Bay; then steer southwestward (southeast of Cape Flattery) over Lake Ozette to the Pacific; then southward to the mouth of the Columbia River. On this route an elevation of 6,000 feet will suffice.

Large seaplanes can fly up the Columbia River to Pasco, Wash.; smaller ones can go up the Columbia to Wenatchee, Wash., and up the Snake River to Lewiston, Idaho.

For land planes the best route between Seattle and Portland is to follow the Northern Pacific Railroad.

New Zealand To Have Air Mail

New Zealand will establish airplane mail routes along lines proven to be practical by the United States Post Office Department, according to J. B. Murphy, of Timarou, who is stopping at the Hotel Seville, New York. Mr. Murphy is interested in an aircraft company in Timarou, New Zealand.

He came to New York for a demonstration of the eight-passenger Liberty-engined Curtiss Eagle, with a view to utilizing it in a tourist sight-seeing service over Mt. Cook, which is the great objective point of tourists in New Zealand. He is already carrying passengers around the 13,000-foot peak in smaller machines.

The government is also encouraging civilian aeronautics by the enactment of laws and establishing landing fields. Mr. Murphy's company will operate out of Timarou between the cities of Christchurch, Dunedin and Inercargill, 400 miles in one direction and 100 miles in another. He has a contract to carry the air mails.

Aeromarine West Indies Airways

Since the Aeromarine West Indies Airways announced the beginning of its aerial mail and passenger service between Key West and Havana, its operating schedule has been carried out with remarkable regularity in spite of those unforeseen obstacles that are usually encountered in a new undertaking. The weather conditions along this route are ideal and the pleasure of an air voyage over these tropical Airways in a big Aeromarine eleven-passenger aerial cruiser can only be appreciated by actual experience.

The novelty of flying which has drawn many patrons to the Airways has now been replaced by its many advantages—speed, comfort and safety. It is a lack of knowledge which is the cause of the "dangerous and sporting character" with which the general public has branded the flying machine and which prevents it from deriving the great benefits offered by this new and wonderful means of transportation and communication. It is to be expected that the Airways between Key West and Havana will quickly succeed in gathering patronage, because many travelers who dread sea voyages will take to the comforts of the air.

These many advantages which the travelers will derive by

THE BEAUTIFUL POSTER OF THE WEST INDIES AIRWAYS

the use of the Airways in preference to the steamship are similar to those which have made the London to Paris air-line so popular, over which thousands of passengers have been carried during the past year.

The following is reprinted from the company's folder.

AEROMARINE SCHEDULE

KEY WEST—HAVANA

U. S. TIME

Lv. Key West	12 noon	Ar. Havana	1.15 p. m.
Lv. Key West	4.30 p. m.	Ar. Havana	5.45 p. m.
Lv. Havana	12 noon	Ar. Key West	1.15 p. m.
Lv. Havana	4.30 p. m.	Ar. Key West	5.45 p. m.

FARE

Key West to Havana—single passage.....$75.00

Bookings may be made and further information secured at our New York, Key West and Havana offices, and at all leading hotels and booking agencies.

Boats may be chartered for trips or tours by special arrangement with the booking agencies or by communication with us.

In actual travel, the Aeromarine saves seven and a quarter hours. This does not take into consideration the hours one is required to wait for the departure of the steamer.

Many persons have asked questions regarding the trip to Havana and the company has put them so clearly that they will interest all aerial travelers:

1. At what hours do Aeromarines sail for Havana? The flying cruisers make immediate connections with trains.
2. How long does it take to fly from Key West to Havana? One hour and a quarter of pleasant and speedy travel.
3. Can passengers carry baggage? Yes. Each passenger is allowed about thirty pounds. Your heavy baggage follows the same night by steamer, and may be called for the next morning at the Havana Customs House. If you send your baggage a day ahead, it will be waiting for you at Havana when you get there.
4. On the return flight from Havana is there any likelihood of missing departing trains? No. Boats leave Havana in ample time to allow comfortable train connections.
5. Do Aeromarines embark and alight at convenient locations? Yes. Our floats are right at the railway terminals.
6. Do you have a special customs officer meet Aeromarine flying boats? Yes. Special arrangements have been made by both governments who have detailed customs officers to special duty at our floats.
7. Are there special passport requirements? Regulations and passport requirements are the same as for other modes of travel. We have been able to secure the cooperation of officials in this country and in Havana to provide special facilities for our passengers.

Pacific Panama Flight Completed

The flight of the fleet of fourteen Navy seaplanes from San Diego to the Canal Zone was completed on January 16. This flight, which covered 3,200 miles and was completed in seventeen flying days, was marred by one fatality, Chief Radio Electrician Cain having been killed at Fronseca Bay, on the western coast of Central America, when he was struck by a propeller of one of the machines. The fliers encountered squalls in crossing the Gulf of Tehuantepec and got a severe shaking up.

The fight, which ranks well up among the longest on record, was over a course never before traversed by aircraft, and the aviators scored a record of only one forced landing.

Starting from San Diego on December 30, the seaplanes made nine stops— Bartolome Bay, Magdalena Bay, Banderas Bay, Acapulco, Salina Cruz, Fonseca Bay, Punta Arenas, Bahia Honda and Panama. Capt. Henry C. Mustin, commanding the squadron, stated upon his arrival that the flight was unique, since only two days were taken up with the preparatory work, while other long flights had been preceded by weeks, and even months, of preparation.

"We had good weather throughout the trip except over the Gulf or Tehuantepec," he said. "Squalls there made me seasick, and I have been flying all sorts of machines for nine years without a similar experience. The only forced landing was in Fonseca Bay."

Supply steamers left San Diego only two days before the machines started, and the journey was completed with only three main supply bases, a destroyer which was pressed into service having become partially disabled.

Commander J. H. Towers, became ill with appendicitis on board a supply ship which did not carry a doctor and received medical attention when a seaplane called by wireless carried a physician from another vessel to his ship.

The jump between Salina Cruz and Fonseca Bay, nearly 500 miles, was made by the fourteen machines without a stop, and was declared to be one of the noteworthy features of the expedition.

The Air Forces of the Atlantic and Pacific fleets are scheduled to meet at Balboa, Panama, the latter part of January. The Atlantic air force will make the passage over the canal, and the great airboats will meet in Balboa and carry on training operations in conjunction with the combined Atlantic and Pacific fleets.

The combined distance covered by the two air forces by the time they return North would if directed in a straight line reach more than half way round the world, and each of the airboats will have to make flights half again as long as that across the Atlantic. The West Coast detachment will fly approximately seven thousand miles on the round trip, nearly one thousand miles longer than that which the East coast detachment will take.

The Pacific fleet air force counts in its complement of aircraft two of the famous NC seaplanes similar to the NC-4 which successfully crossed the Atlantic in the spring of 1919.

In the course of the trips the Navy pilots have to cross unfamiliair bays and harbors and encounter unknown air currents and treacherous weather conditions. The airboats however, have to put up with adverse weather just as do the battleships of the fleets.

The Navy Department is very much gratified that the fleet aircraft have reached such a stage of development that it has been possible for the commander-in-chief of the Atlantic and Pacific fleets to lay down for their air forces schedules of employment exactly as is done each year for our battleships, cruisers and submarines.

A Coco Solo--Santa Marta Flight

The Naval Air Detachment of Coco Solo, Panama Canal Zone planned a flight to the following ports of Colombia, South America, arriving Cartagena, January 4, Barranquilla on January 6, and Santa Marta, January 8 and returning to Coco Solo by January 10. The flight consisted of three F-5-L seaplanes. The expedition was convoyed by the U.S.S. destroyer *McCormick* and *Eagle Four*. The flight was in charge of Lieut. Commdr. V. D. Herbster, U. S. N., commanding officer of the Naval Air Station, Coco Solo, C. Z.

Arkansas City Air Tournament

A successful air tournament was held in Arkansas City, Kan., December 12 under the management of the Williams-Hill Airplane Co. The commanding officer of Post Field sent over eight men and six planes to assist. There was a total of thirteen planes on the field and all took part in the various contests. Over four thousand people were on the field and a great many more watched from the outside. The estimated receipts were $1,700 which will be used to build a hangar at the field.

The winners of the various events were as follows:

Thirty mile Derby to Winfield and return, Lieut. Johnson, time 10 min. 39 1-5 seconds.

Landing for mark, Lieut. Beverly. The first try at this event was a tie between Beverly and Lucas, and in the second trial Beverly was announced the winner.

Fifteen mile derby to Chilocco and return, C. J. Lucas, time 12 min. 20 seconds.

Loop-the-loop from a height of 2,500 feet, down to 1,000 feet, Lieut. Mills in the German Fokker. He looped twelve times in that distance.

Altitude climb of two minutes for government planes, Lieut. Johnson who climbed 2,500 feet.

Altitude climb for commercial plane, Dick Phillips.

Three landings and take offs, Lieut. Beverly.

The first event of the afternoon's program was the flying of the five De Havilands and the German Fokker, in battle formation. This was an inspiring sight and one that had never before been witnessed in Arkansas City.

A local refinery furnished 1,000 gallons of gasoline for the planes taking part in the events of the day and delivered the gas to the men on the grounds. They also gave to the visitors enough gasoline to fly each of the planes to their home towns.

The machines on the field included five DH's and a Fokker from Post Field, two planes belonging to Williams and Hill; a Curtiss Standard, owned by C. A. Williams of Forrest City, Mo.; a Curtiss Standard owned by Shirley DeVore of Central, Kan.; a Curtiss Standard owned by Mr. Knox of Covington, Oklo.; and an American Curtiss, owned by the Wadell Motor Co. of Wichita and a Curtiss belonging to the Curtiss Southwest Aircraft Co., of Tulsa.

Walter Beach piloted the plane on which the Human Squirrel put on his stunts. Dick Phillips piloted the plane in which Frank Armstrong of Ponca City, the parachute man, leaped from a distance of 5,000 ft.

A dinner was held in the evening at which the seven loving cups that were the prizes were presented. These cups were donated by seven different firms in the city.

Aeronautical "Sportsmen"

If two aviators who recently took part in an aerial duck hunt for the benefit of one of the leading news pictorial film companies can be located by the New York State Conservation Commission they are liable to acquire a severe distaste for duck hunting in any shape, manner or form for some time to come.

Pictures of the "duck hunt" displayed recently were labeled "Duck Hunt by Airplane," and the sub-captions conveyed the additional information that the "hunt" took place somewhere on Long Island. Those who witnessed the film are ready to state that as a pot-hunting performance it was in a class by itself, for it consisted in swooping down out of the sky to a point a few feet above a marsh on which thousands of ducks had settled, and then, when the birds had taken wing in clouds, driving the machines among them and sending thousands to destruction beneath the whirling propeller blades and by blows received from falling afoul of the wings, struts and other parts of the machines.

This picture brought a horrified protest to officials of the State Conservation Commission. Inspector Claude Hanion, in charge of the Metropolitan and Long Island division of the commission's activities, said that he himself had witnessed the picture in question, and that it would go hard for the aviators in question if he could locate them. The Conservation Law fixes a penalty of $60 and $25 additional for each bird killed in such an unlawful manner, he said, and if the aviators could be located they will have " to settle good and hard."

Thomas-Morse Plane powered with 300 H.P. Wright Engine. 2nd place Pulitzer Trophy Air Race

RECORDS INCOMPARABLE!

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AMERICAN engineering has contributed no finer thing than the remarkable performance of the Wright Aeronautical Engines in the Pulitzer Trophy Air Race.

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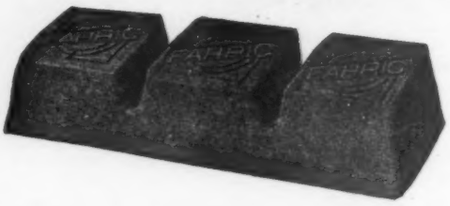

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